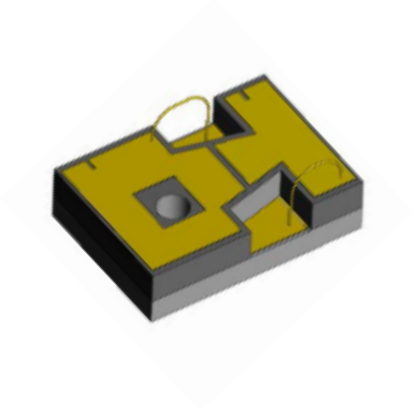
# 0.7 mm Movement Free Space *et*MEMS™ Attenuator Sub-mount

(Protected by US patent 10752492B2 )

DATASHEET

Return to the Webpage



The etMEMS™ series of free space variable optical attenuator (FS-VOA) is based on a proprietary patent pending micro-electro-mechanical mechanism featuring exceptionally compact size with large shutter movement, simple construction, and easy direct drive. The FS-VOA is designed to completely block a collimated light beam over 700 µm in diameter and be operated in air without the need for hermetic seal and is fully compliant with the Telcordia 1209 and 1221 reliability standards. The device is ideally suited to be integrated into laser and receiver systems.

It is available in either normally-open or normally-closed configurations.

## Features

- Compact
- High Reliability
- Direct drive
- Low IL, PDL, WDL & TDL
- Intrinsic tolerance to ESD

## Applications

- Power Control
- Power Regulate
- Channel Balance
- Instrumentation

## Specifications

| Parameter | Min | Typical | Max | Unit |
|---|---|---|---|---|
| Attenuation Resolution | | Continuous | | |
| Aperture Diameter | | 750 | | µm |
| Response Time [1] | | 40 | 75 | ms |
| Optical Power Handling | | 500 | | mW |
| Driving Voltage [2] | | 4 | 4.2 | V |
| Device Resistance | | 100 [3] | | ohm |
| Power Consumption | | | 210 | mW |
| Resonant Frequency | 250 | 310 | | Hz |
| Operating Temperature | -5 | | 75 | °C |
| Storage Temperature | -40 | | 85 | °C |
| Reliability | Telcordia 1209 and 1221 | | | |
| Package Dimension | See drawing below | | | |

**Note**:

[1]. For any desired attenuation. 50ms time constant of control signal is recommended to eliminate the low frequency resonance ≤ 200 Hz. Please refer to Agiltron's design of driving circuit to eliminate the low freqeuncy resonance.

[2]. For full attenuation.

[3]. At voltage 3.6V.

**Note:** The specifications provided are for general applications with a cost-effective approach. If you need to narrow or expand the tolerance, coverage, limit, or qualifications, please [click this link]:



Rev 04/01/25



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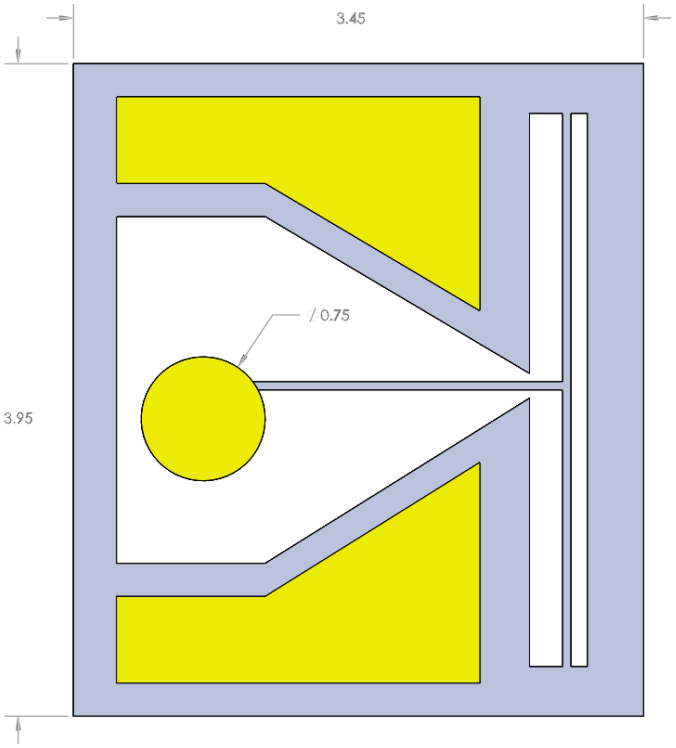
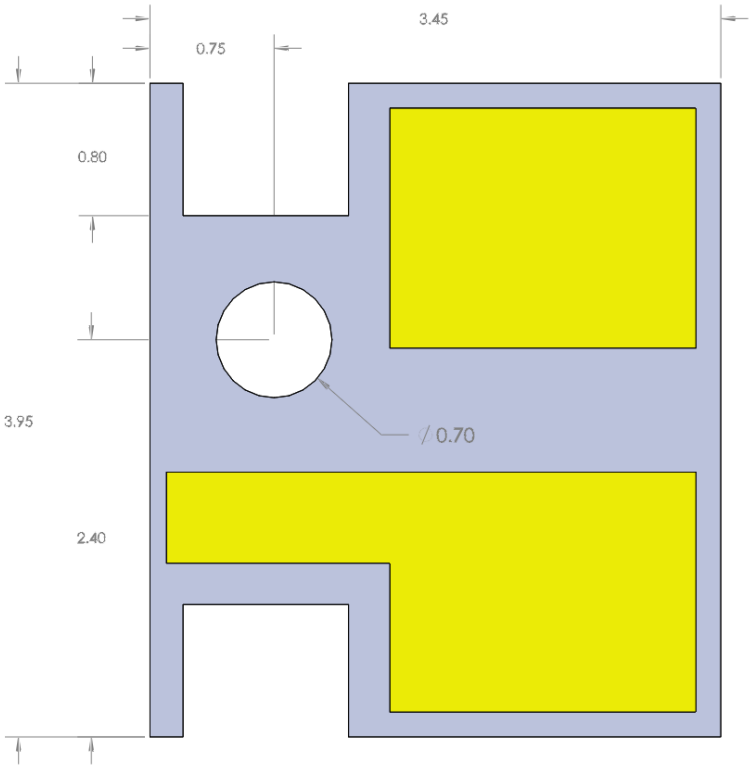
## Mechanical Footprint Dimensions (mm)

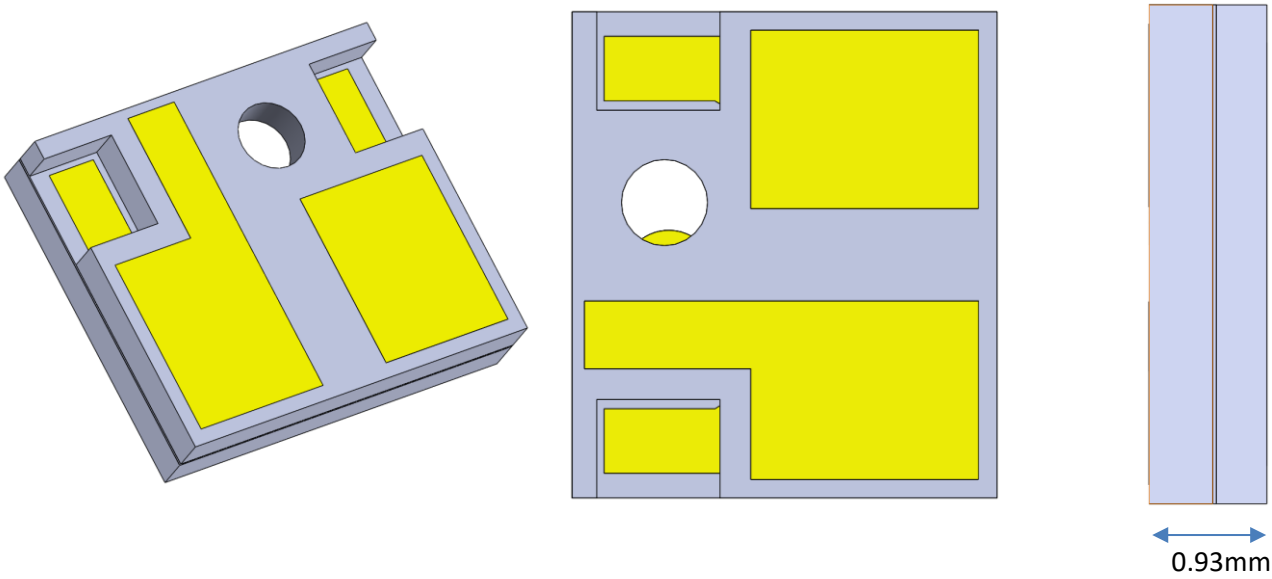
### Device chip




### Holder chip




### After package




*Product dimensions may change without notice. This is sometimes required for non-standard specifications.

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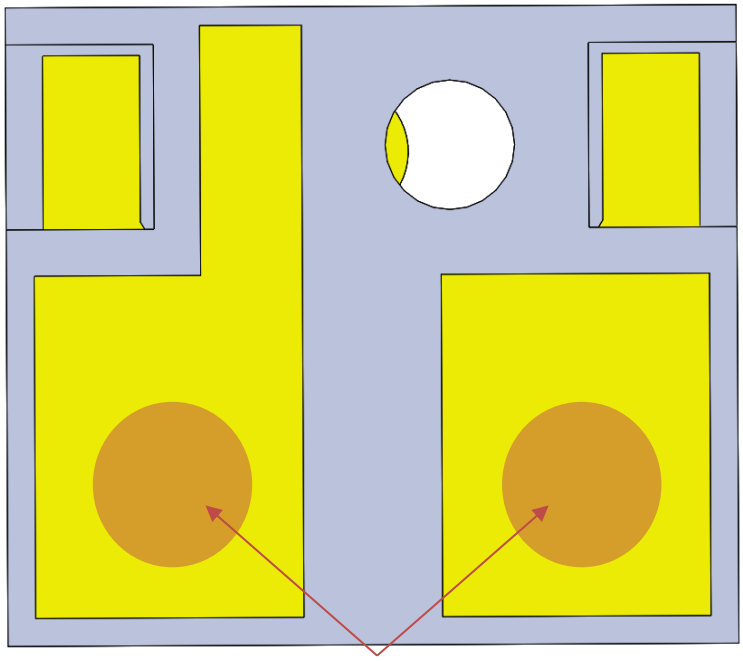
## Mechanical Footprint Dimensions (mm)

### Chip on Sub-mount: Normally-open with ϕ750 aperture



Flying wires soldering position
Approximate wire diameter: 40 um

Note: The variety of chips and customization are available, please contact us.

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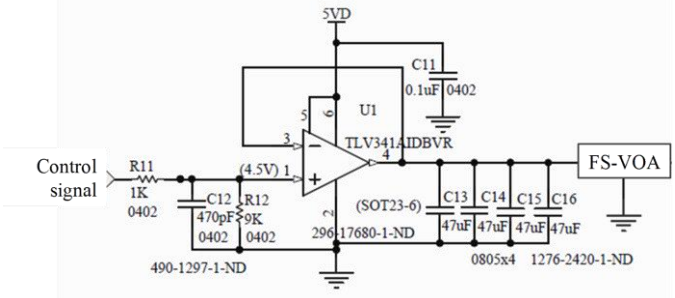
## Electronic Driving Instruction

**NOTES:**

- Resistive without polarity
- Applying >4.2V will burn the chip
- Two pads are for applying a voltage
- Reference driving circuit on the right



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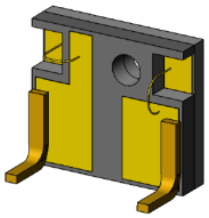
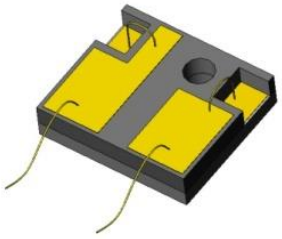
## Shutter Performance (Typical)

## Electronic Pin Option for sub-mount (Illustration)

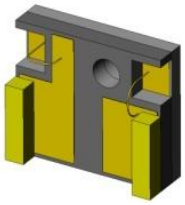
L-pins



Flying Wires



Mounting Shorts



*Product dimensions may change without notice. This is sometimes required for non-standard specifications.

## Ordering Information

| | 7 0 | 1 | ☐ | 1 | ☐ | ☐ | ☐ | 1 |
|---|---|---|---|---|---|---|---|---|
| **Prefix** | **Shutter size** | **Wavelength** | **VOA Type** | **Shutter Surface** | **Chip Package** | **Chip Design** | **Electric Connection** | **Package** |
| **FSVOA-** | Ø700um [1] = 70 | Broadband = 1 | Standard = 1<br>Special = 0 | Gold = 1 | Bare = 2<br>Sub-mount [2] = 1<br>Special = 0 | Standard = 1<br>Special = 0 | No PIN = 0<br>L Pin = 1<br>Flying Wires = 2<br>Mounting shorts = 3 | Sub-mount = 1 |

[1]. Different shutter size is available, please check another size FS-VOA chip datasheet.

[2]. Flying wires type; two leads are provided

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## VOA Performance